

### **REMARKS**

Applicants appreciate the Examiner's thorough consideration provided the present application. Claims 1 and 4-10 are now present in the application. No claims have been amended in this Reply. Claim 1 is independent. Reconsideration of this application is respectfully requested.

### **Information Disclosure Citation**

Applicants thank the Examiner for considering the references supplied with the Information Disclosure Statements filed on June 25, 2008, and for providing Applicants with an initialed copy of the PTO-1449 forms filed therewith.

### **Claim Rejections Under 35 U.S.C. § 103**

Claims 1-6 and 9 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Kim, U.S. Patent No. 6,640,024, in view of Facq, U.S. Patent No. 5,307,437. This rejection is respectfully traversed.

A complete discussions of the Examiner's rejection is set forth in the Office Action, and is not being repeated here.

Independent claim 1 recites a combination of elements including "a deflector provided in each of said first and second optical waveguide, the deflectors being arranged to deflect light propagating in one of the light guiding structures to the other light guiding structure by operation of said external resonator, wherein the deflector in at least one of said first and second optical waveguides comprises: a first tilted deflector arranged in said at least one of said first and second

optical waveguides, and a second tilted deflector arranged in said at least one of said first and second optical waveguides, wherein said first tilted deflector and said second tilted deflector are superimposed upon each other, and arranged to deflect light out from said at least one of said first and second optical waveguides into two individual beams, and wherein each of said first tilted deflector and said second tilted deflector comprises a blazed Bragg grating.” Applicants respectfully submit that the combination of elements as set forth in independent claim 1 is not disclosed or suggested by the references relied on by the Examiner.

#### **Kim**

Kim in FIG. 7 discloses an add-drop wavelength filter with a tilted Bragg grating 310. However, Kim simply uses this tilted Bragg grating for switching between two modes *within a dual mode optical fiber*. More specifically, Kim simply uses this tilted Bragg grating in order to switch from a fundamental mode (LP01) into a higher-order mode (LP11). Kim nowhere teaches that this tilted Bragg grating is used to deflect light *out from the fiber core*. Instead, the technology of Kim *would not function if the tilted Bragg grating were arranged to deflect the light out from the fibers*.

In addition, Kim mentions the use of a dual core fiber for an add-drop wavelength filter (see col. 2, lines 42-48) shown in FIG. 8. However, Kim also explicitly explains that the Bragg grating is written within only one core of the dual core fiber. Furthermore, as evident from FIG. 8 of Kim, the Bragg grating 350 is a plane (i.e. not tilted) grating.

Therefore, Kim fails to teach “a deflector provided in each of said first and second optical waveguide, the deflectors being arranged to deflect light propagating in one of the light guiding

structures to the other light guiding structure by operation of said external resonator” as recited in claim 1.

In addition, Kim also fails to teach “an external resonator defined by a first and a second mirror, said first and said second mirror being provided on opposite sides and outside of said first and second light guiding structures, and said external resonator being resonant to a specific wavelength” as recited in claim 1 as acknowledged by the Examiner, and “the deflector in at least one of said first and second optical waveguides comprises: a first tilted deflector arranged in said at least one of said first and second optical waveguides, and a second tilted deflector arranged in said at least one of said first and second optical waveguides, wherein said first tilted deflector and said second tilted deflector are superimposed upon each other, and arranged to deflect light out from said at least one of said first and second optical waveguides into two individual beams” as recited in claim 1 (see below).

### **Facq**

Although Facq discloses tilted Bragg gratings for deflecting light out from an optical fiber, by using Facq’s tilted Bragg gratings to deflect light out from an optical fiber in Kim, Kim would not operate as intended (i.e., switching from a fundamental mode (LP01) into a higher-order mode (LP11)) if the tilted Bragg grating were arranged to deflect the light out from the fibers. Therefore, one skilled in the art would not have the motivation to use Facq’s tilted Bragg gratings to deflect light out from an optical fiber in Kim.

In addition, the Examiner has correctly acknowledged that Kim fails to teach an external resonator. The Examiner then turned to rely on Facq and alleged that Facq can cure the

deficiencies of Kim. Applicants respectfully disagree. In particular, although Facq discloses tilted Bragg gratings for deflecting light out from an optical fiber, such a deflected (or extracted) light is reflected from mirrors for various purposes. However, Facq nowhere discloses that the mirrors are configured to form a resonator. In fact, as shown in FIGs. 6A and 6B of Facq, the light exits from the fiber 50 and reflects once from the mirror 51, whereupon it re-enters the fiber 50 (the light as indicated by the arrows is present only on one side between the fiber 50 and the mirror 51 in FIG. 6B). In other words, *no resonance is obtained*. Similar non-resonant reflection from mirrors can be also seen in FIGs. 7, 8, 10 and 11 of Facq.

In FIG. 4 of Facq, an optical system 28 in the form of a cylindrical, ellipsoidal mirror is used for reflecting an extracted beam of light from one fiber to the other. Again, no resonance is involved. The lack of resonance can be seen directly from FIG. 4 of Facq, because the arrows showing the light path go directly from one fiber to the other without any resonance. More importantly, the ellipsoidal mirror as shown in FIG. 4 of Facq cannot produce any resonant coupling between the fibers due to its geometry.

In summary, Facq simply uses the mirrors in a traditional sense, *i.e.*, as reflecting mirrors from which light is reflected once without giving rise to any resonant phenomena. The geometry of having an ellipsoidal mirror cannot give rise to resonant coupling between two fibers according to the present invention. Facq clearly fails to teach any external resonator as recited in claim 1, and also fails to teach any resonant coupling between two fibers.

**Failure to Establish a *Prima Facie* case of Obviousness**

Although the Examiner alleged that Kim in view of Facq teaches each and every element in claim 1, the Examiner nowhere explained where and how Kim in view of Facq teaches “said first tilted deflector and said second tilted deflector are superimposed upon each other, and arranged to deflect light out from said at least one of said first and second optical waveguides into two individual beams” as recited in claim 1.

Similarly, the Examiner also nowhere explained where and how Kim in view of Facq teaches the subject matter of dependent claims 8 and 9.

In addition, although the Examiner alleged that Kim in view of FIG. 5 in Facq teaches “said first tilted deflector and said second tilted deflector are *oriented at a right angle* with respect to each other” as recited in claim 1, the tilted gratings shown in FIG. 5 of Facq are *parallel* to each other and situated in *different* fibers.

In view of the above, Applicants respectfully submit that the Examiner fails to establish a *pima facie* case of Obviousness.

Accordingly, neither of the utilized references individually or in combination teaches or suggests the limitations of independent claim 1. Therefore, Applicants respectfully submit that independent claim 1 clearly defines over the teachings of the utilized references.

In addition, claims 4-10 depend, either directly or indirectly, from independent claim 1, and are therefore allowable based on their respective dependence from independent claim 1, which is believed to be allowable.

In view of the above remarks, Applicants respectfully submit that claims 1 and 4-10 clearly define the present invention over the references relied on by the Examiner. Accordingly,

reconsideration and withdrawal of the rejections under 35 U.S.C. § 103 are respectfully requested.

### **Additional Cited References**

Since the remaining patents cited by the Examiner have not been utilized to reject the claims, but rather to merely show the state of the art, no further comments are necessary with respect thereto.

### **CONCLUSION**

All the stated grounds of rejection have been properly traversed and/or rendered moot. Applicants therefore respectfully request that the Examiner reconsider all presently pending rejections and that they be withdrawn.

It is believed that a full and complete response has been made to the Office Action, and that as such, the Examiner is respectfully requested to send the application to Issue.

In the event there are any matters remaining in this application, the Examiner is invited to contact Cheng-Kang (Greg) Hsu, Registration No. 61,007 at (703) 205-8000 in the Washington, D.C. area.

Application No.: 10/520,478  
Reply dated January 21, 2009  
Reply to Office Action dated October 21, 2008

Docket No.: 0104-0500PUS1

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. §§1.16 or 1.17; particularly, extension of time fees.

Dated: January 21, 2009

Respectfully submitted,

By 

Paul C. Lewis

Registration No.: 43,368

BIRCH, STEWART, KOLASCH & BIRCH, LLP

8110 Gatehouse Road

Suite 100 East

P.O. Box 747

Falls Church, Virginia 22040-0747

(703) 205-8000

Attorney for Applicant